INSTALLATION, OPERATION & MAINTENANCE – 60 Hz

DMS Saber Series

Air Cooled Packaged Air Conditioners

16 to 28 TR

YORK
BY JOHNSON CONTROLS

Contents

GENERAL

YORK Saber units are single package air conditioners equipped with optional factory installed electric heaters and designed for outdoor installation on a rooftop or steel structure.

The units are completely assembled on a rigid base frame. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require electric power, duct connections and drain piping connections at the point of installation.

The supplemental electric heaters have nickel-chrome elements and utilize single point power connection.

SAFETY CONSIDERATIONS

Due to system pressure, moving parts and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained, service personnel should install, repair, maintain or service this equipment.

Observe all precautions in the literature, on labels and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other safety precautions that apply.

Wear safety glasses and work gloves, and follow all safety codes. Use a quenching cloth and have a fire extinguisher available for all brazing operations.

INSPECTION

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill.

RENEWAL PARTS

Refer to YORK® USER'S MAINTENANCE and SERVICE INFORMATION MANUAL. It is strongly suggested that only genuine YORK® Spare Parts are used to ensure long life, product and operator safety and efficient working of the unit.

⚠ CAUTION

THIS PRODUCT MUST BE INSTALLED IN STRICT COMPLIANCE WITH THE ENCLOSED INSTALLATION INSTRUCTIONS AND ANY APPLICABLE LOCAL, STATE, AND NATIONAL CODES INCLUDING, BUT NOT LIMITED TO, BUILDING, ELECTRICAL, AND MECHANICAL CODES.

⚠ WARNING

IMPROPER INSTALLATION MAY CREATE A CONDITION WHERE THE OPERATION OF THE PRODUCT COULD CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

Installer should pay particular attention to the words :
NOTE, CAUTION and WARNING.

NOTES are intended to clarify or make the installation easier.
CAUTIONS are given to prevent equipment damage.
WARNINGS are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

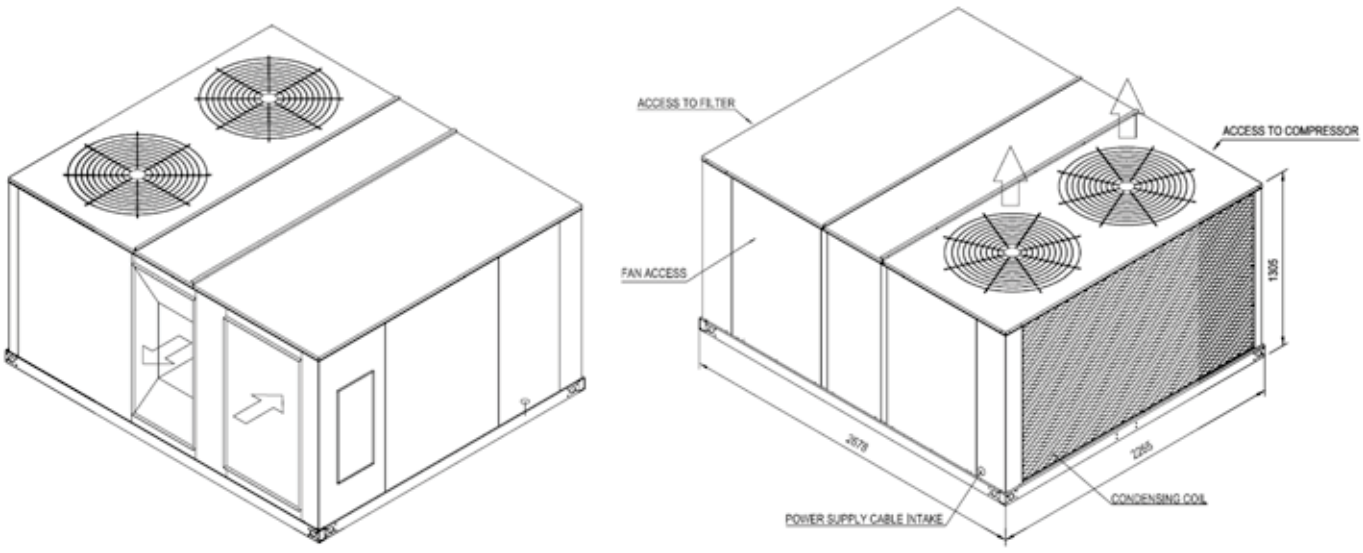
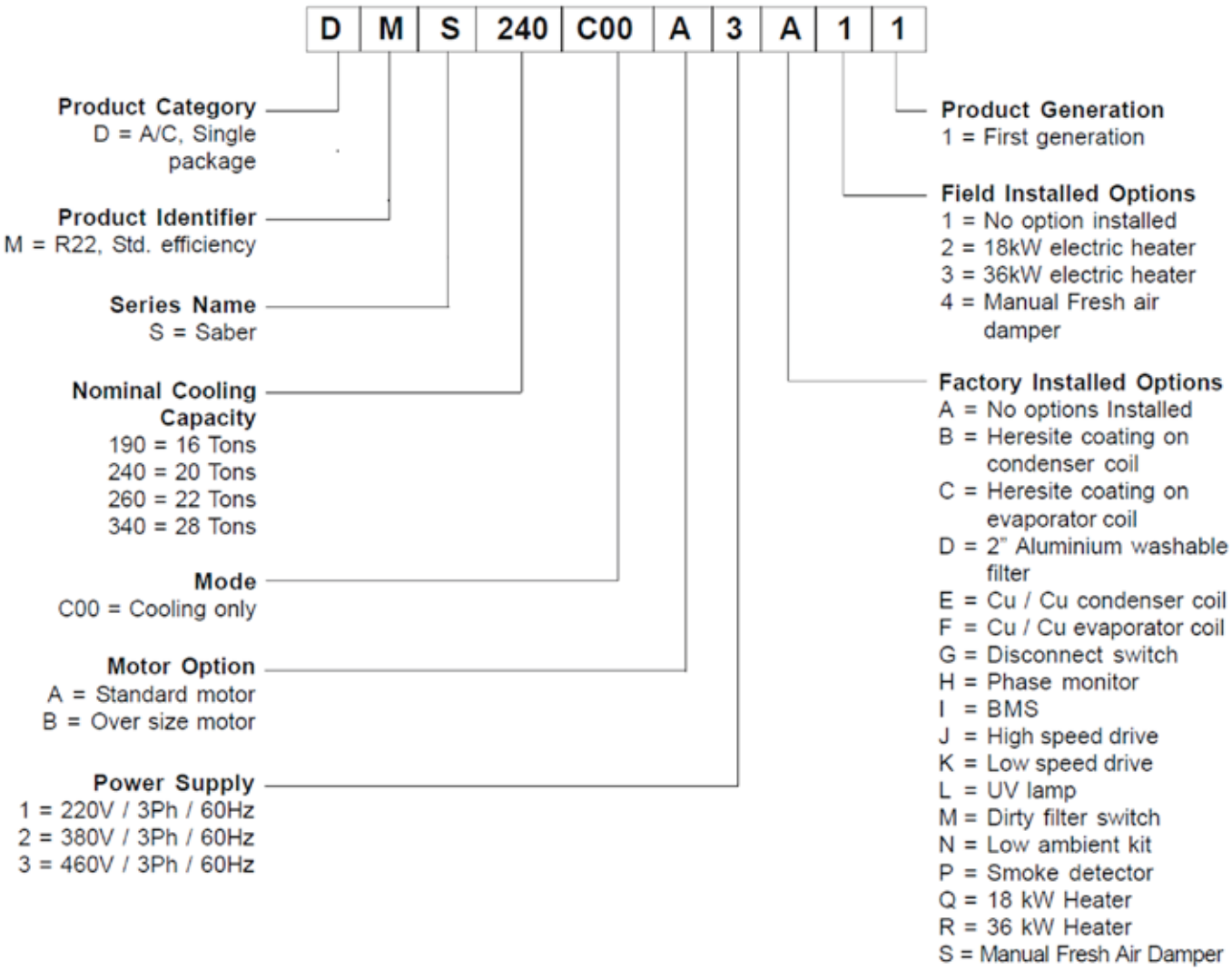


Figure 1: Typical Unit Configuration

PRODUCT NOMENCLATURE



INSTALLATION

Read these instructions before continuing this appliance installation. This is an outdoor combination heating and cooling unit. The installer must assure that these instructions are made available to the consumer and with instructions to retain them for future reference.

LIMITATIONS

These units must be installed in accordance with the applicable national and local safety codes. (Refer to Unit Application Data table).

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense. Size of unit for proposed installation should be based on heat loss/ heat gain calculation.

Unit Model Number		DMS 190	DMS 240	DMS 260	DMS 340
Voltage Variation (min/max)	220V/3Ph/60Hz	200/240			
	380V/3Ph/60Hz	342/418			
	460V/3Ph/60Hz	414/506			
Supply Airflow Rate (min/max)	cfm	4800/7200	5400/8400	6000/9000	7000/11500
On-Coil Wet Bulb Temperature (min/max)	°F	57/72			
Ambient Air Temperature (min/max)	°F	50/125 (30/125 with Low Ambient Option)			

Table 1: Unit Application Data

LOCATION

Use the following guidelines to select a suitable location for these units :

1. Unit are designed for outdoor installation only.
2. Condenser coils must have an unlimited supply of air.
3. Where a choice of location is possible, position the unit on either north or east side of building.
4. For ground level installation, use a level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the unit base rails. Do not tie slab to the building foundation.
5. Roof structures must be able to support the weight of the unit and its options and/or accessories. Unit must be installed on a solid level roof curb or appropriate angle iron frame.
6. Maintain level tolerance to 1/2 inch maximum across the entire length or width of the unit.

RIGGING AND HANDLING

Exercise care when moving the unit. Do not remove anypackaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the round lifting holes provided in the base rails. Spreaders, whose length exceeds the largest dimension across the unit, MUST BE USED. Refer to Figure 3. Units may also be moved or lifted with a forklift, from the side only, provided that an accessory skid is used.

LENGTH OF FORKS MUST BE A MINIMUM OF 90". Refer to the Product Data Table 5 for unit weights.

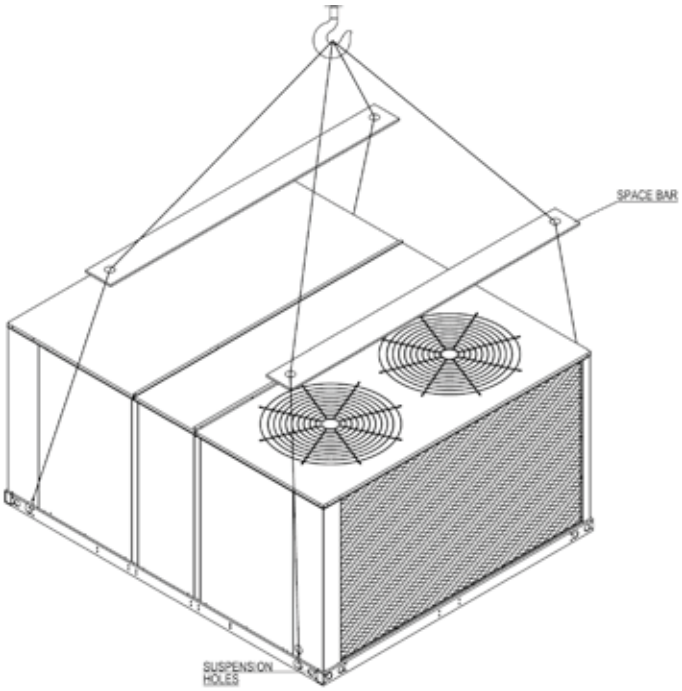


Figure 2: Typical Rigging

WARNING

BEFORE LIFTING A UNIT, MAKE SURE THAT ALL PANELS ARE IN PLACE AND THAT ITS WEIGHT IS DISTRIBUTED EQUALLY ON ALL CABLES SO IT WILL LIFT EVENLY

CLEARANCES

All units require certain clearances for proper operation and service. Installer must make provisions for adequate ventilation air in accordance with applicable provisions of the local building codes. Refer to Dimensions and Clearances. Refer Figure 8 for the clearances required for servicing, and proper unit operation.

WARNING

DO NOT PERMIT OVERHANGING STRUCTURES OR SHRUBS TO OBSTRUCT OUTDOOR AIR DISCHARGE OUTLET.

DUCTWORK

A closed return duct system should be used. This should not preclude use of outdoor fresh air intake.

The supply and return air duct connections at the unit should be made with flexible joints to minimize noise. The supply and return air duct systems should be designed for the CFM and static requirements of the job. They should NOT besized to match the dimensions of the duct connections on the unit.

WARNING

WHEN FASTENING DUCTWORK TO SIDE DUCT FLANGES ON UNIT, INSERT SCREWS THROUGH DUCT FLANGES ONLY. DO NOT INSERT SCREWS THROUGH CASING. OUTDOOR DUCTWORK MUST BE INSULATED AND WATERPROOFED.

Refer to Dimensions and Clearances Figure 8 for information concerning supply and return air duct openings.

FIXED OUTDOOR AIR INTAKE DAMPER

This damper is shipped inside the return air compartment. It is completely assembled and ready for installation. Refer to the Fixed Outdoor Damper Figure 3.

Gasketing and mounting screws are provided in a parts bag. Adjusting the damper to the desired air flow may be done after installation by opening or closing dampers with handle.

Damper provides maximum of 25% fresh air when fully opened.

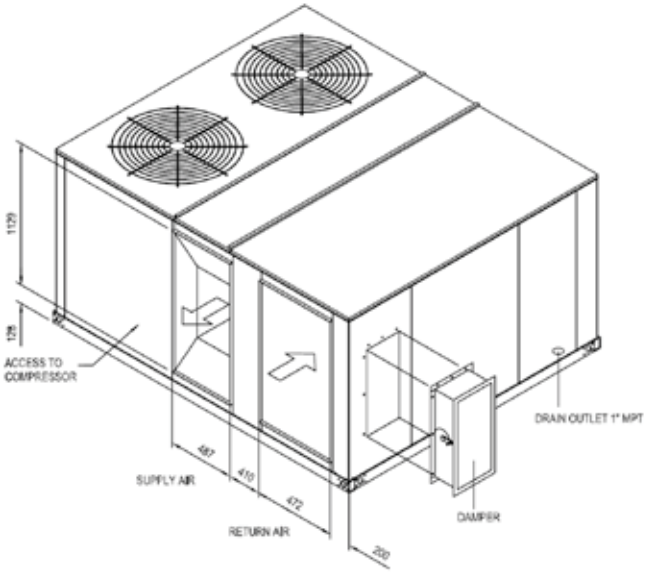


Figure 3: Fixed Outdoor Air Damper

CONDENSATE DRAIN

Plumbing must conform to local codes. Use a sealing compound on male pipe threads. Install a condensate drain line from the one inch FPT female connection on the unit to an open drain.

NOTE : The condensate drain operates in a negative pressure in the cabinet. The condensate drain line MUST be trapped to provide proper drainage. See Figure 4.

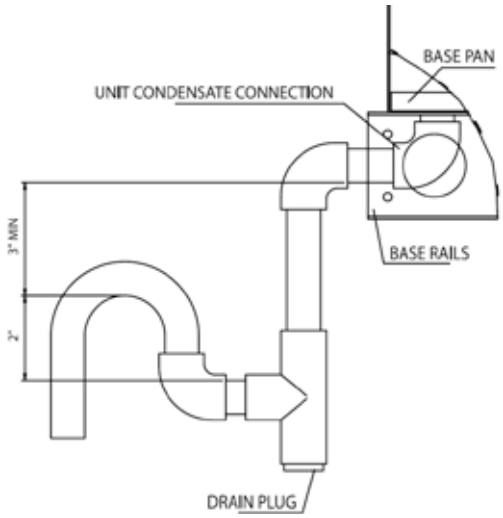
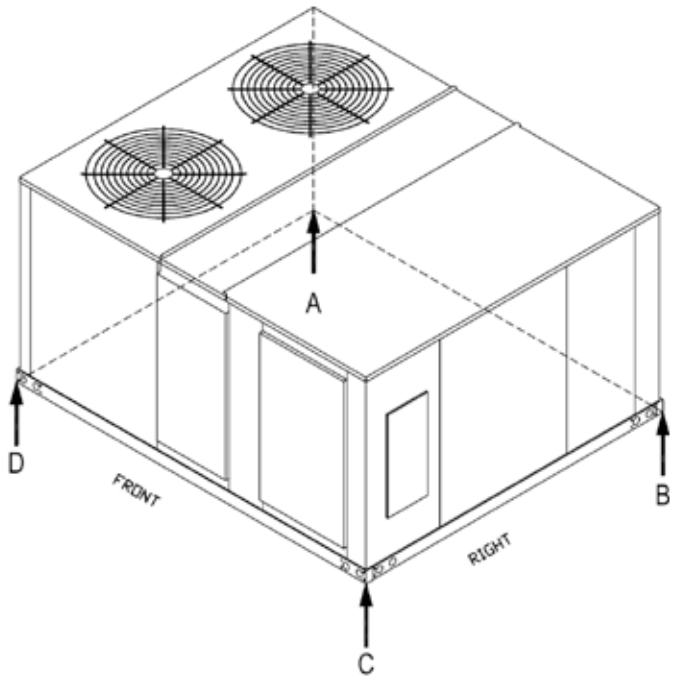
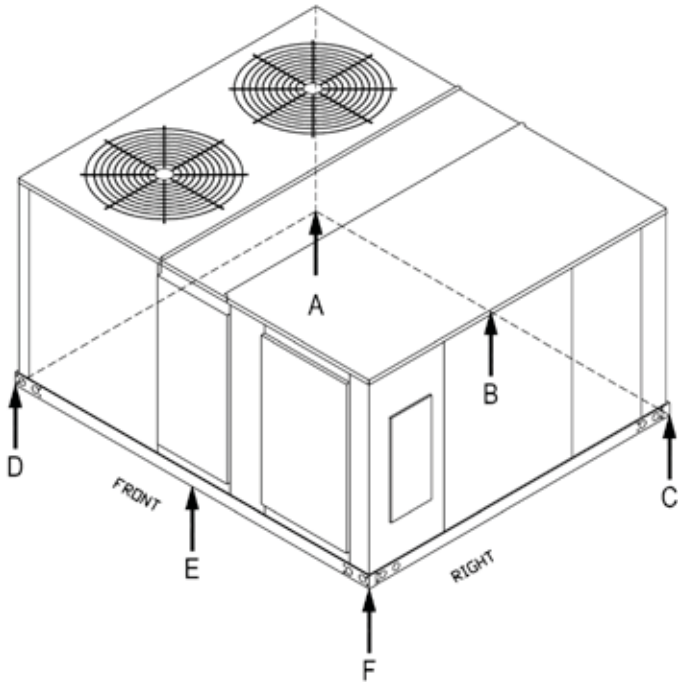


Figure 4: Recommended drain piping



Model	Location lbs (kgs)				
	A	B	C	D	Total
DMS 190	468.6 (213)	380.6 (173)	591.8 (269)	398.2 (181)	1840.0 (836)
DMS 240	479.6 (218)	385.0 (175)	627.0 (285)	398.2 (181)	1890.0 (859)
DMS 260	517.0 (235)	413.6 (188)	664.4 (302)	429.0 (195)	2024.0 (920)
DMS 340	536.8 (244)	429.0 (195)	695.2 (316)	440.0 (200)	2101.0 (955)

Figure 5: Four Point Load



Model	Location lbs (kgs)						
	A	B	C	D	E	F	Total
DMS 190	299.2 (136)	336.6 (153)	213.4 (97)	402.6 (183)	378 (172)	209 (95)	1840 (836)
DMS 240	303.6 (138)	349.8 (159)	209.0 (95)	429.0 (195)	396 (180)	202 (92)	1890 (859)
DMS 260	327.8 (149)	378.4 (172)	224.4 (102)	453.2 (206)	422 (192)	218 (99)	2024 (920)
DMS 340	334.4 (152)	402.6 (183)	228.8 (104)	473.0 (215)	442 (201)	220 (100)	2101 (955)

Figure 6: Six Point Load

COMPRESSORS

Units are shipped with factory adjusted compressor mountings and ready for operation.

CAUTION

DO NOT LOOSEN COMPRESSOR MOUNTING BOLTS. REMOVE COMPRESSOR SHIPPING BRACKETS BEFORE START-UP.

FILTERS

Two inch filters can be supplied with each unit. Filters must always be installed ahead of the evaporator coil and must be kept clean or replaced with same size and type. Dirty filters will reduce the capacity of the unit and will result in frosted coils or safety shutdown. Minimum filter area and required sizes are shown in Product Data Table 4.

SERVICE ACCESS

The following removable panels provide access to all serviceable components :

- Compressor compartment
- Electric Heat compartment
- Blower compartment
- Main control box
- Filter compartment

Refer to the Dimensions and Clearances Figuress 8 & 9 for location of these access panels.

THERMOSTAT

The room thermostat should be located on an inside wallapproximately 56 inches above the floor where it will not besubject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow manufacturers instructions enclosed with thermostat for general installation procedure. A minimum of seven color coded insulated wires (#18 AWG) should be used to connect thermostat to unit.

POWER AND CONTROL WIRING

Field wiring to the unit must conform to provisions of the National Electrical Code and/or local ordinances. The unit must be electrically grounded in accordance with NEC and/or local codes.

Voltage tolerances, which must be maintained at the compressor terminals, during starting and running conditions, are indicated on the unit Rating Plate and the Unit Application Data table.

A fused disconnect switch should be field provided based on the tabulated rating, with a short circuit capacity of 10K or more, for the unit. The switch must be separate from all other circuits. Wire entry at knockout openings require conduit fittings to comply with local codes. Refer to the Dimensions and Clearances Figures 8 for installation location.

If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram and the same minimum gauge as the replaced wire.

Electrical line must be sized properly to carry the load. Use copper conductors only. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

Emergency stop button should be field installed as per wiring diagram. The activator should be red in colour with a yellow outline background, and should be easily accessible. The device should be self latching type and contacts must be of positive opening operation, certified to EN60947 - 5 - 1.

CAUTION

WHEN CONNECTING ELECTRICAL POWER AND CONTROL WIRING TO THE UNIT, WATERPROOF TYPE CONNECTORS MUST BE USED SO THAT WATER OR MOISTURE CANNOT BE DRAWN INTO THE UNIT DURING NORMAL OPERATION. THE ABOVE WATERPROOFING CONDITIONS WILL ALSO APPLY WHEN INSTALLING A FIELD SUPPLIED DISCONNECT SWITCH.

Refer to Typical Wiring Diagram, Figure 7 and to the appropriate unit wiring diagram for control circuit and power wiring information.

Wire Size	Maximum Length (1)
18 AWG	150 feet

From the unit to the thermostat and back to the unit

Table 2: Control Wire Sizes

OPTIONAL ELECTRIC HEAT

The factory-installed heaters are wired for single point power supply. Power supply need only be brought into the single point terminal block and thermostat wiring to the low voltage terminal strip located in the upper portion of the unit control box.

These heaters are located within the central compartment of the unit with the heater elements extending into the supply air chamber.

Refer to Figure 8 for access panel location. Fuses are supplied by the factory. Refer to Table 3 for minimum CFM limitations and to Table 5 for electrical data.

Nominal Heater Size	V / 3Ph / 60Hz	Minimum CFM			
		DMS-190	DMS-240	DMS-260	DMS-340
18 kW, 2 stages	220/230, 380,460	4800	5400	6000	7000
36 kW, 2 stages					

Table 3: Minimum CFM Limitation

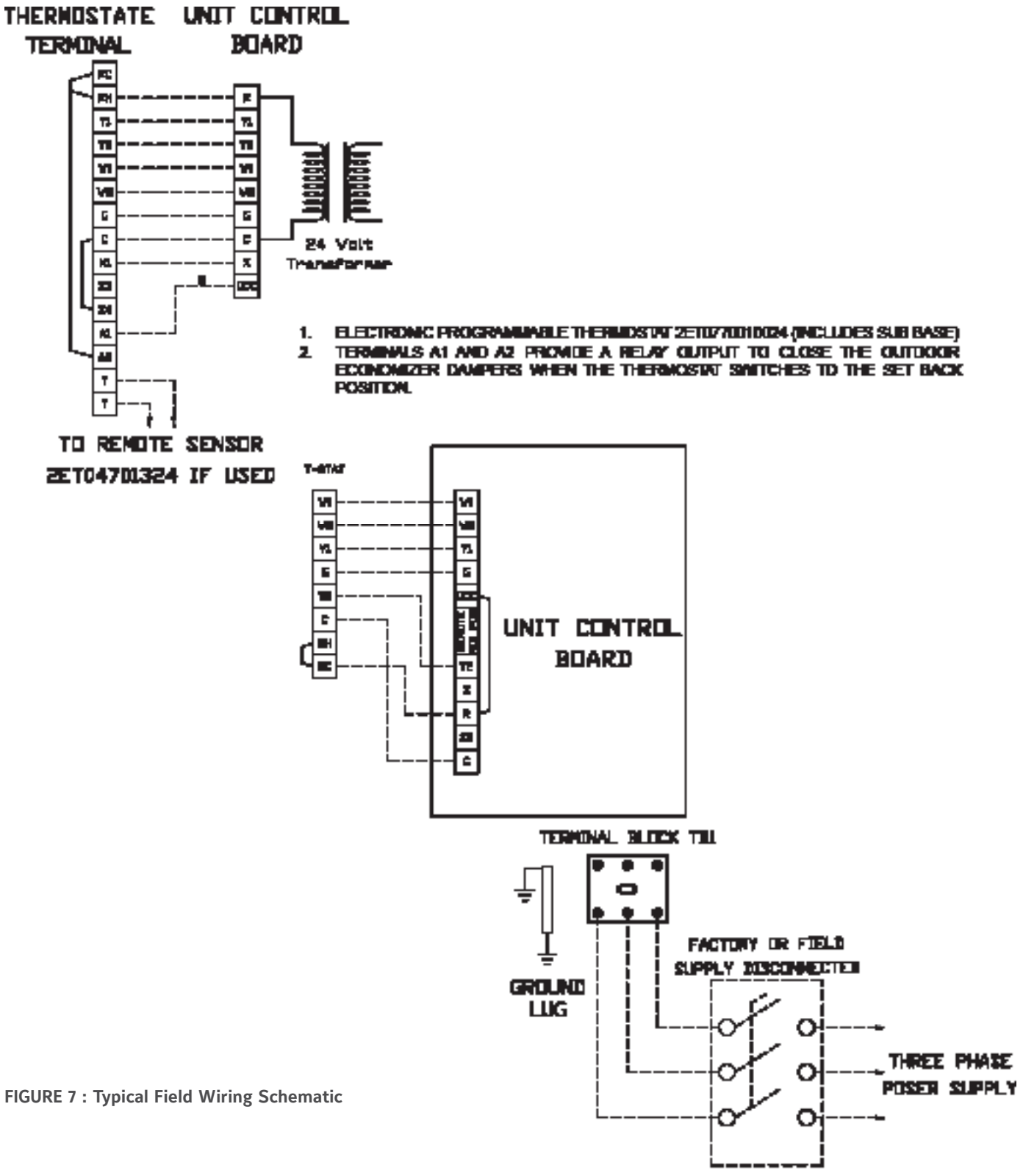


FIGURE 7 : Typical Field Wiring Schematic

PRODUCT DATA

MODEL DMS			190	240	260	340
Ratings @ARI Conditions	EER	Btu/W	9.3	11.8	11.9	9.4
	Capacity	MBH kW	190.7 55.9	246.5	259	322.1
	Compressor Power Input	HP kW	20.5 15.3	19.7	20.8	35.6
Electric Heating Capacities	Option 1	MBH kW	61.4 18.0	61.4	61.4	61.4
	Option 2	MBH kW	122.8 36.0	122.8	122.8	122.8

Evaporator Coil	Tube / Fins			Copper / Aluminum Louvered			
	Area		ft² m²	13.33 1.24	17.3 1.6	23.6 2.2	23.6 2.2
	Fin Spacing		fpi mm	10 2.5			
Condenser Coil	Tube / Fins			Copper / Aluminum Louvered			
	Fin Spacing		fpi mm	12 2.1	14 1.8	12 2.1	12 2.1
	Area		ft² m²	24.3 2.3	26.7 2.5		
Blower Fan & Motor	Fan Type			Forward Curved Centrifugal - DIDW			
	Fan Quantity			1			
	Motor Type			4 Pole, Class F Insulation, Totally Enclosed Fan Cooled, IP54, 1700 rpm			
	Motor Size	std	hp kW	4.0 3.0	5.5 4.0	5.5 4.0	7.5 5.5
		xtd	hp kW	5.5 4.0	7.5 5.5	7.5 5.5	10.0 7.5
Condenser Fan & Motor	Type			4 Blade Heavy Duty Propeller Fan			
	Quantity		#	2			
	Motor Type			6 Pole, Class F Insulation, Totally Enclosed Fan Cooled, IP54 1100 rpm			
	Motor size		hp kW	1.5 1.1			
	Quantity		#	2			
Compressor	Type			Hermetic Reciprocating	Hermetic Scroll		
	Quantity		#	2			
Refrigerant	Type			R - 22			
	Charge Cir A		lbs kgs	12.2 5.5	15 6.8	17 7.7	18 8.2
	Charge Cir B		lbs kgs	11 5	15 7.7	17 7.7	18 8.2
Dimensions	Height		inches mm	52.5 1333.0	51.3 1303.0		
	Width		inches mm	77.8 1976.0	89.1 2263.0		
	Length		inches mm	89.0 2271.0	105.4 2677.0		
Filters	h x l x d - Qty		inches mm	20 x 24 x 2 - 4# 508 x 610 x 50 - 4#	20 x 24 x 2 - 3# 508 x 610 x 50 - 3#		
	h x l x d - Qty		inches mm	----	24 x 24 x 2 - 3# 610 x 610 x 50 - 3#		
Weights	Basic Unit		lbs kg	1463 665	1890 859	2025 920	2100 955

Table 4: Product data

DIMENSIIONAL DATA - DMS 190

Clearances	inches	mm
Front (Control Panel & Comp Access)	36	914
Left (Filter Access)	30	762
Right (Condenser Coil)	36	914
Above (Condenser Air Discharge)	72	1829

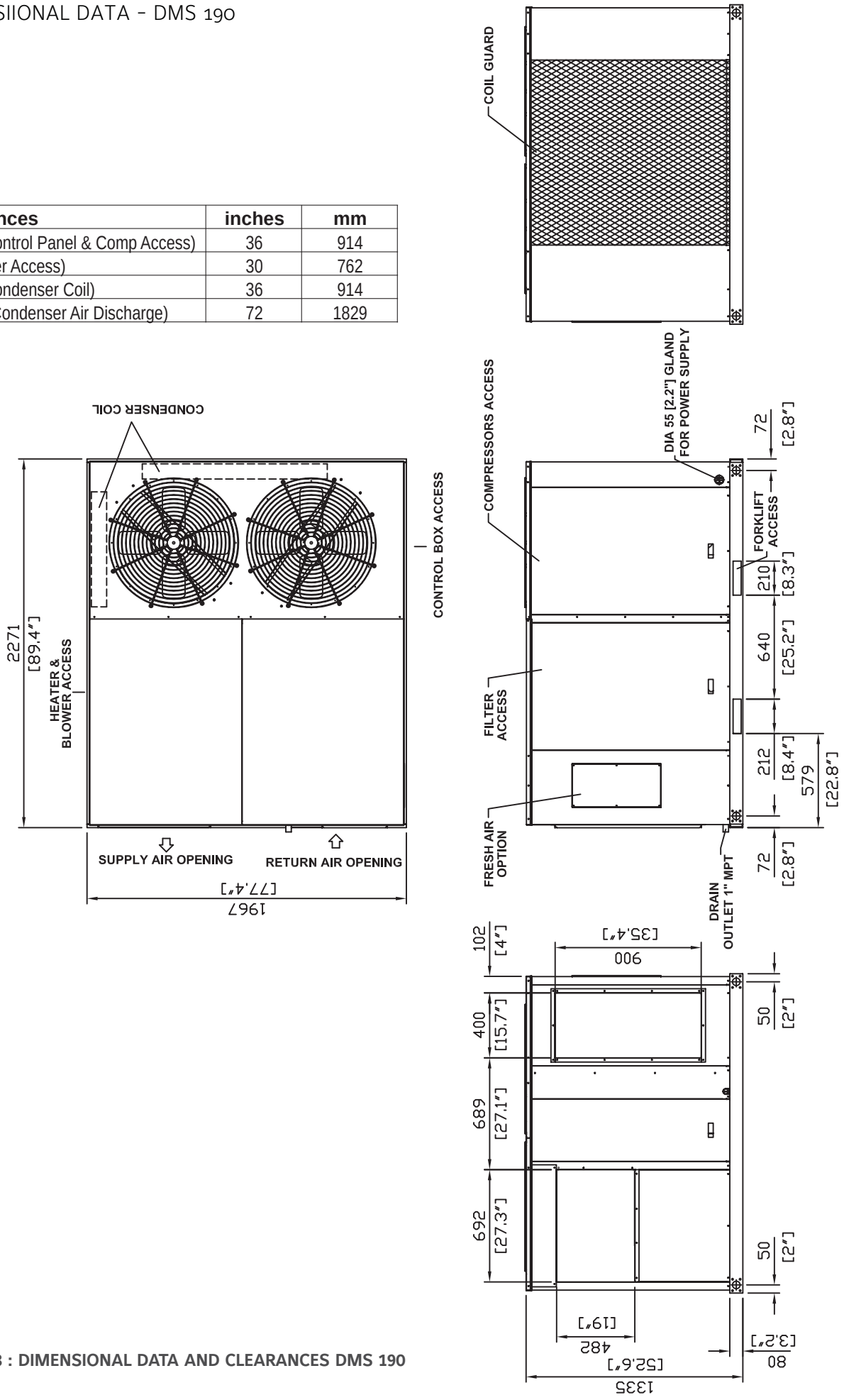
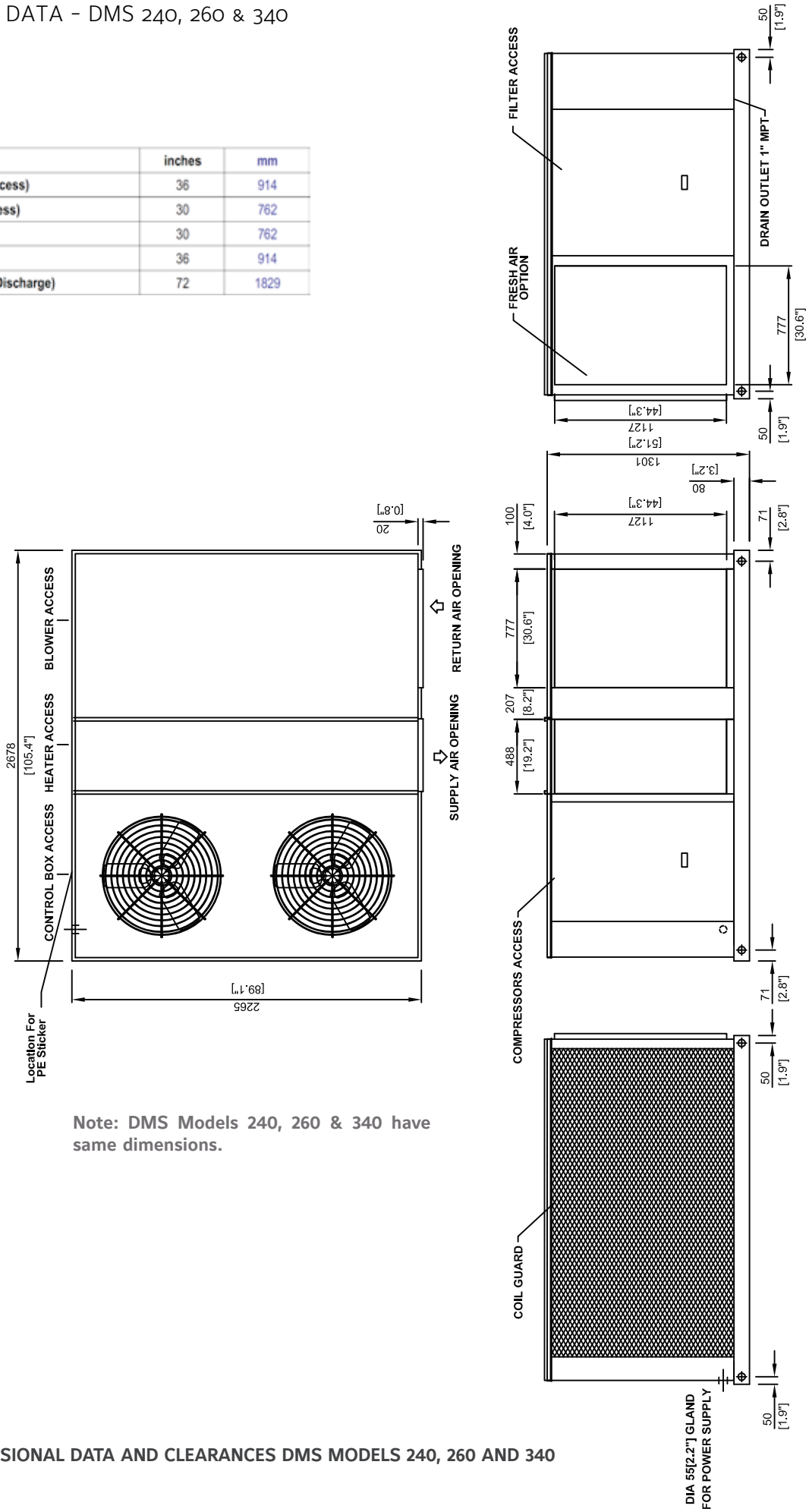


FIGURE 8 : DIMENSIONAL DATA AND CLEARANCES DMS 190

DIMENSIIONAL DATA - DMS 240, 260 & 340

Clearances	inches	mm
Front (Control Panel Access)	36	914
Back (Compressor Access)	30	762
Left (Filter Access)	30	762
Right (Condenser Coil)	36	914
Above (Condenser Air Discharge)	72	1829



Note: DMS Models 240, 260 & 340 have same dimensions.

FIGURE 9 : DIMENSIONAL DATA AND CLEARANCES DMS MODELS 240, 260 AND 340

DRIVE AND PULLEY DATA

MODEL	Low Static Drive Set											
	Motor Pulley	Bush	Pitch Dia.		Fan Pulley	Bush	Pitch Dia	rpm range		rpm setting	Centre Dist.	Belt Size
			min	max								
DMS			mm				mm	min	max	-	mm	
190	VAR 108 A1	1210 x 28mm	78	102	SPA-224 1	2012 x 25mm	224	609	797	710	597	1687
240	VAR 108 A1	1210 x 28mm	78	102	SPA-212 1	2012 x 25mm	212	644	842	750	597	1668
260	VAR 108 A1	1210 x 28mm	78	102	SPA-280 1	2012 x 25mm	280	488	638	600	597	1775
340	VAR 139 A1	1610 x 38mm	109	133	SPA-355 1	2012 x 25mm	355	537	656	680	597	1942

MODEL	Standard Drive Set											
	Motor Pulley	Bush	Pitch Dia.		Fan Pulley	Bush	Pitch Dia	rpm range		rpm setting	Centre Dist.	Belt Size
			min	max								
DMS			mm				mm	min	max	-	mm	
190	VAR 108 A1	1210 x 28mm	78	102	SPA-170 1	1610 x 25mm	170	803	1050	920	597	1432
240	VAR 108 A1	1210 x 28mm	78	102	SPA-160 1	1610 x 25mm	160	853	1116	985	597	1432
260	VAR 108 A1	1210 x 28mm	78	102	SPA-212 1	2012 x 25mm	212	644	842	705	597	1668
340	VAR 177A1	2012 x 38mm	149	171	SPA-3551	2012 x 25mm	355	735	843	790	597	2003

MODEL	High Static Drive Set											
	Motor Pulley	Bush	Pitch Dia.		Fan Pulley	Bush	Pitch Dia	rpm range		rpm setting	Centre Dist.	Belt Size
			min	max								
DMS			mm				mm	min	max	-	mm	
190	VAR 108 A1	1210 x 28mm	78	102	SPA-150 1	1610 x 25mm	150	910	1190	1050	597	1571
240	VAR 146 A1	1610 x 38mm	116	140	SPA-200 1	2012 x 25mm	200	1015	1225	1120	597	1709
260	VAR 146 A1	1610 x 38mm	116	140	SPA-265 1	2012 x 25mm	265	766	925	850	597	1811
340	VAR 146 A1	1610 x 38mm	116	140	SPA-250 1	2012 x 25mm	250	812	980	900	597	1788

Table 5: Drive and Pulley data

ELECTRICAL DATA

Model	DMS-190								
Voltage	Compressors		Condenser Fan Motors	Supply Blower Motor		Electric Heater		Minimum Circuit Amperes	Maximum Fuse Breaker Size
				Standard	Extended				
	RLA Each	LRA Each	FLA Each	FLA		kW	Amperes	Amperes	Amperes
220 V / 3Ph / 60 Hz	25.9	140.0	5.4	11.4	14.2	-	-	89.4	125
						18.0	47.2	89.4	125
						36.0	94.5	116.3	150
380 V / 3Ph / 60 Hz	15.1	102.0	3.1	6.4	8.2	-	-	52.0	70
						18.0	27.4	52.0	70
						36.0	54.7	67.3	90
460 V / 3Ph / 60 Hz	11.6	90.0	3.2	5.7	7.5	-	-	42.4	60
						18.0	22.6	42.4	60
						36.0	45.2	57.4	80

Model	DMS-240								
Voltage	Compressors		Condenser Fan Motors	Supply Blower Motor		Electric Heater		Minimum Circuit Amperes	Maximum Fuse Breaker Size
				Standard	Extended				
	RLA Each	LRA Each	FLA Each	FLA		kW	Amperes	Amperes	Amperes
220 V / 3Ph / 60 Hz	29.5	237.0	5.4	14.2	19.0	-	-	105.1	150
						18.0	47.2	105.1	150
						36.0	94.5	119.5	150
380 V / 3Ph / 60 Hz	17.5	160.0	3.1	8.2	11.0	-	-	62.0	80
						18.0	27.4	62.0	80
						36.0	54.7	69.1	90
460 V / 3Ph / 60 Hz	14.3	130.0	3.2	7.5	10.0	-	-	52.3	70
						18.0	22.6	52.3	70
						36.0	45.2	59.1	80

Model	DMS-260								
Voltage	Compressors		Condenser Fan Motors	Supply Blower Motor		Electric Heater		Minimum Circuit Amperes	Maximum Fuse Breaker Size
				Standard	Extended				
	RLA Each	LRA Each	FLA Each	FLA		kW	Amperes	Amperes	Amperes
220 V / 3Ph / 60 Hz	29.5	237.0	5.4	14.2	19.0	-	-	105.1	150
						18.0	47.2	105.1	150
						36.0	94.5	119.5	150
380 V / 3Ph / 60 Hz	17.5	160.0	3.1	8.2	11.0	-	-	62.0	80
						18.0	27.4	62.0	80
						36.0	54.7	69.1	90
460 V / 3Ph / 60 Hz	14.3	130.0	3.2	7.5	10.0	-	-	52.3	70
						18.0	22.6	52.3	70
						36.0	45.2	59.1	80

Model	DMS-340								
Voltage	Compressors		Condenser Fan Motors	Supply Blower Motor		Electric Heater		Minimum Circuit Amperes	Maximum Fuse Breaker Size
				Standard	Extended				
	RLA Each	LRA Each	FLA Each	FLA		kW	Amperes	Amperes	Amperes
220 V / 3Ph / 60 Hz	40.8	255.0	5.4	19.0	25.2	-	-	141.2	200
						18.0	47.2	141.2	200
						36.0	94.5	141.2	200
380 V / 3Ph / 60 Hz	26.4	155.0	3.1	11.0	15.6	-	-	89.4	125
						18.0	27.4	89.4	125
						36.0	54.7	89.4	125
460 V / 3Ph / 60 Hz	20.4	135.0	3.2	10.0	13.6	-	-	71.8	90
						18.0	22.6	71.8	90
						36.0	45.2	71.8	90

Table 6: Electrical data

FAN PERFORMANCE

Model	Fan	Motor		Air Flow Rate		External Static Pressure in.wg. [Pa]																	
		Standard	Optional			0.20	[50]	0.40	[100]	0.60	[149]	0.80	[199]	1.00	[249]	1.20	[299]	1.40	[349]	1.60	[399]	1.80	[448]	2.00	[498]
DMS	Size	kW	kW	cfm	L/s	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW	RPM	kW
190	15 / 15	3	4	4000	1888	560	0.61	628	0.73	691	0.84	751	0.97	810	1.11	867	1.26	922	1.42	975	1.58	1027	1.75	1078	1.93
				5000	2360	639	1.03	699	1.19	753	1.32	806	1.46	856	1.60	904	1.76	952	1.93	999	2.10	1044	2.29	1090	2.48
				5800	2737	709	1.50	761	1.68	811	1.86	859	2.03	905	2.18	948	2.34	992	2.50	1033	2.68	1075	2.87	1116	3.07
				6500	3067	772	2.03	820	2.22	866	2.42	910	2.62	952	2.80	995	2.98	1034	3.16	1073	3.33	1111	3.52	1149	3.72
240	15 / 15	4	5.5	5400	2548	644	1.17	701	1.33	754	1.49	806	1.65	855	1.79	902	1.94	947	2.11	992	2.28	1035	2.47	1079	2.66
				6400	3020	727	1.81	776	2.00	824	2.19	870	2.39	914	2.58	957	2.75	999	2.93	1038	3.10	1077	3.28	1116	3.47
				7400	3492	814	2.67	857	2.87	900	3.08	940	3.32	981	3.55	1020	3.77	1058	3.99	1096	4.21	1132	4.40	1167	4.58
				8400	3964	906	3.80	944	4.03	982	4.26	1019	4.50	1055	4.76	1091	5.02	1126	5.28	-	-	-	-	0	0.00
260	18 / 18	4	5.5	6000	2831	468	0.95	521	1.11	566	1.26	611	1.42	656	1.60	701	1.78	747	2.00	792	2.23	837	2.48	881	2.73
				7000	3303	512	1.37	560	1.56	606	1.75	644	1.93	682	2.10	720	2.30	758	2.50	796	2.70	836	2.95	875	3.20
				8000	3775	553	1.88	600	2.12	640	2.33	680	2.55	717	2.75	750	2.96	783	3.16	816	3.37	849	3.60	882	3.83
				9000	4247	601	2.56	642	2.81	683	3.07	720	3.31	754	3.55	789	3.79	819	4.02	848	4.24	877	4.47	906	4.70
340	18 / 18	5.5	7.5	7000	3303	512	1.37	560	1.56	606	1.75	644	1.93	682	2.10	720	2.30	758	2.50	796	2.70	836	2.95	875	3.20
				8500	4011	573	2.18	617	2.43	658	2.66	699	2.90	732	3.12	766	3.34	800	3.56	830	3.78	860	4.00	890	4.22
				10000	4719	656	3.41	696	3.72	731	4.00	767	4.28	802	4.55	832	4.81	862	5.08	892	5.34	919	5.59	945	5.84
				11500	5427	735	4.98	769	5.33	803	5.69	834	6.01	865	6.33	896	6.65	924	6.96	952	7.26	-	-	-	-

Shaded area represent upsize motors

Table 7: Fan Performance data

CHECKING SUPPLY AIR CFM

The RPM of the supply air blower will depend on the required CFM, the unit accessories or options and the static resistances of both the supply and the return air duct systems. With this information, the RPM for the supply air blower and the motor pulley adjustment (turns open) can be determined from the Fan Performance Data Tables. High speed drive accessories (containing a smaller blower pulley and a shorter belt) are available for applications requiring the supply air blower to produce higher CFM and/or higher static pressures. Refer to the Drive and Pulley Data Table 6.

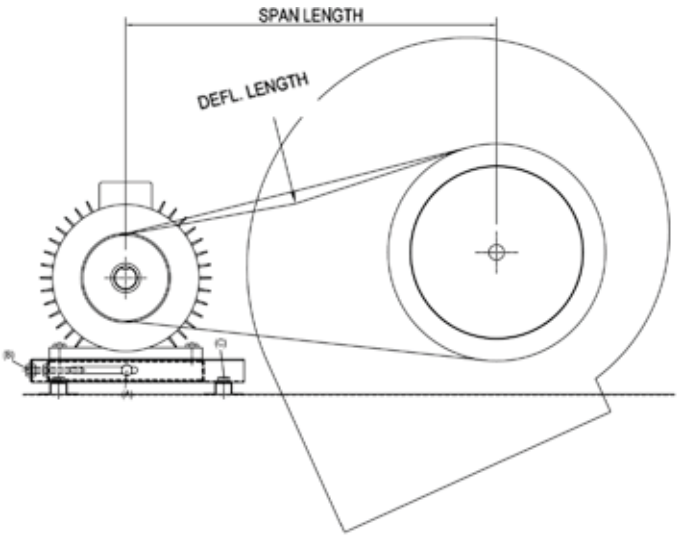


Figure 10: Belt adjustment

Note the following :

1. The supply air CFM must be within the limitations shown in the Unit Application Data Table 1.
2. Pulleys can be adjusted in half turn increments.
3. The tension on the belt should be adjusted as shown inthe Belt Adjustment Figure 10.

Start the supply air blower motor. Adjust the resistances in both the supply and the return air duct systems to balance the air distribution throughout the conditioned space. The job specifications may require that this balancing be done by someone other than the equipment installer.

WARNING

FAILURE TO PROPERLY ADJUST THE TOTAL SYSTEM AIR QUANTITY CAN RESULT IN EXTENSIVE BLOWER DAMAGE

Safety

This section of the IOM covers Safety Aspects applicable to the York DMS Saber Roof Top Air Conditioners. Adherence to the instructions detailed hereunder, will ensure the safety of the operators, prevent damage to the equipment and prevent accidents.

Figure 11: Unit Nameplate

YORK

Sr.#	
Frame	QSX90L6B02

IP	54
ICL	F
IC	41
S	1

V	kW	Ph	Hz	rpm	A	Cos Φ
Δ 220	1.1	3	60	1110	5.4	0.72
Y 380	1.1	3	60	1110	3.1	0.72
Y 460	1.1	3	60	1125	3.2	0.67
Y 380-415	1.1	3	50	935	3.3	0.69

TERMINOLOGY

The internal section of the unit adjacent to moving parts and electrical parts or devices is considered as the 'danger zone'. Prior to gaining access to these parts, it is necessary to acquire the proper tools to deactivate the safety devices. The operators are responsible for transport, installation, start up, service and maintenance, including cleaning and trouble shooting.

OPERATIONAL SAFETY

York DMS Saber Roof Top Packages Air Conditioners in conformance to the highest standards of operational as well as operator safety. Nevertheless, hazards may occur if the units are used for purposes other than the designed use(s), Units are operated by untrained staff and / or Units are not operated in conformance with general standards prevalent in the industry.

OPERATION AND USE OF THE UNIT IN CONFORMANCE WITH GENERAL STANDARDS AND PROVISIONS

YORK® DMS Saber Roof Top Packaged Air Conditioners are designed for and are able to cool, heat, filter air and operate in the fan mode. Any other use is considered not in conformity with general provisions.

The manufacturer is not responsible for any resulting damages. All responsibility resulting from such non conformity rests with the user. In order to use the unit according to general provisions proper instructions for installation, exercise and transport must be observed.

Installation and start up of the unit must satisfy the national codes and standards having legal validity in the country of use. The user is responsible for compliance with standards. Additionally, any type of work that may compromise safety should be avoided. Arbitrary transformations or modifications to the unit by the user or operator are not permitted and nullify the warranty of the manufacturer. The manufacturer will also not be responsible for any damages to the equipment, to property or to personnel.

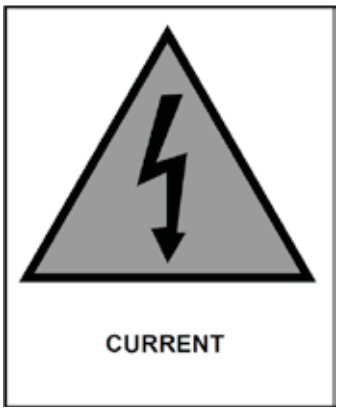
ADHERENCE OF THE USER / OPERATOR TO THE WARNINGS AND OTHER INSTRUCTIONS

Clear signs are placed at appropriate locations on the unit showing:

1. Prohibition to repair or adjustments during motion.

2. Obligation to turn off the power before opening the access doors.

3. Warnings against coming into contact with electrical parts.



All warnings and signs regarding the units must be absolutely observed.

STAFF TRAINING

The unit should be started up and serviced (routine and corrective maintenance) by authorized and trained staff only. This staff must be informed about possible hazards regarding :

- Electrical connections
- Piping connections
- Duct connections
- Start up

These operations must be executed only by trained persons. who, on behalf of the user, attend to control and to perform extraordinary / ordinary maintenance of the unit. It is necessary to establish and to respect the responsibilities for control and maintenance to guaranty safety, without confusion.

USE OF THE UNIT

The unit must be started up only by means of proper safety devices. The installer is obliged to install the unit according to installation plans and conditions. Only authorized persons must operate the unit.

The staff in charge is obliged to immediately inform the user of any changes that may compromise safety. For this reason it is necessary to inspect for eventual anomalies or damages at least once a week.

The user or operator must never dismount and deactivate safety devices. If these have to be removed for maintenance, all safety devices must be reinstalled at their correct location once the maintenance is complete. For all operations of maintenance, the power source must be locked out.

If it is necessary to undertake maintenance activities, the fan must be switched off, isolated and allowed to run down.

RECOMMENDED SAFETY PRACTICES

This publication explains the proper use and installation of equipment in order to warn operating and maintenance personnel of the commonly recognized dangers associated with this equipment. In addition to following the manufacturer's installation instructions, care must be taken to ensure compliance with federal, state and local rules, regulations, codes and standards.

Applicable standards of EEC Machinery Directive	Measures taken	Ref to Harmonised procedure
1.1.1 Defination	Referred in Instruction Manual	
1.1.2a,b,c,d,e,f Principles of safety Integration	Refer to "safety considerations" in Instruction Manual	
1.1.3 Materials and products	Refer to Instruction manual	
1.1.5 Desgin of machinery to facilitate its handling	Design of unit with basement for lifting by forklift or rope, locking of compressor fixings during transport	UNI EN 12100-1& 12100-2
1.2.1 Safety and Reliability of control system	Refer to Electrical schematic pasted inside the unit	UNI EN 12100-1& 12100-2
1.2.2 Control Devices	control devices are positioned outside danger zone, Emergency stop to be provided by customer, loop for same provided & Described in IOM	UNI EN 12100-1& 12100-2
1.2.3 starting	For Start/Restart, Voluntary actuation required for change of temperature settings, Machine doesn't have several starting controls	UNI EN 12100-1& 12100-2
1.2.4 stopping devices	Refer to Electrical schematic pasted inside the unit, Normal stopping can be activated by main disconnect switch, its in customer scope	UNI EN 12100-1& 12100-2
1.2.4 a Emergency stop	Customer's scope, Loop for emergency stop is provided in Electrical schematic	UNI EN 12100-1& 12100-2
1.2.6 Failure of the power supply	Failure o power supply will stop the machine, once power is restored, voluntary actuation is required to restart.	UNI EN 12100-1& 12100-2
1.2.7 failure of the control circuit	Machine doesn't start without manual interaction, stop has got priority over start	UNI EN 12100-1& 12100-2
1.2.8 Software	Refer to IOM for details of Simplicity Programming	UNI EN 12100-1& 12100-2
1.3.2 Risk of breakup during operation	operating conditions stated on the as built drawings, frequency of maintenance listed in the instruction manual, Fixed guards are provided so that breakage will be contained.	UNI EN 12100-1& 12100-2
1.3.4.Risks due to surfaces, edges or angles.	covers will be put on sharp edges of screws	UNI EN 12100-1& 12100-2
1.3.7 Preventation of risks related to moving parts.	access door openable with special tools , written warnings fitted on access door.	UNI EN 12100-1& 12100-2
1.3.8 choice of protection against risks related to moving parts		
1.4.1 General Requirements		
1.4.2.1 Fixed Gurards		
1.5.1 Electricity supply	Refer to page 7 of IOM, + 10% voltage fluctuation limit specified	UNI EN 12100-1& 12100-2
1.5.4 Error of fittings	Refer to IOM	UNI EN 12100-1& 12100-2
1.5.8 Noise	Refer to IOM for Noise data	UNI EN 12100-1& 12100-2
1.5.9 Vibration	Refer to IOM	UNI EN 12100-1& 12100-2
1.6.1 Machinery maintenance	Refer to page 19 of Instruction Manual	UNI EN 12100-1& 12100-2
1.6.2 Access to operating position and servicing points	Refer to Unit dimensional drawing in IOM	UNI EN 12100-1& 12100-2
1.6.3 Isolation of energy sources	Refer to IOM for warning Notes	UNI EN 12100-1& 12100-2
1.6.4 Operator intervention	Work instruction of safety procedures manual	UNI EN 12100-1& 12100-2
1.6.5 Cleaning of internal part	Refer to maintenance schedule in IOM	UNI EN 12100-1& 12100-2
1.7.1 Warning devices	Written warning in proximity to electrical and rotating pars, loops for warning devices is provided refer to wiring schematic	UNI EN 12100-1& 12100-2
1.7.2 warning of residual risk	Refer to IOM	UNI EN 12100-1& 12100-2
1.7.3 Marking	Marking on metal name plate displayed on the outside fan section access door & on control panel door	UNI EN 12100-1& 12100-2

OPERATION

SOUND POWER RATINGS

A sound power level is a measure of the total noise radiated by the machine in all directions. It is a property of the machine and is essentially independent of the measuring environment. Sound power levels are useful to equipment manufacturers, buyers, installers, and users for:

- Calculating the sound pressure level from a machine at a given distance in a given environment.
- Comparing the noise output from different machines.
- Setting specifications for the maximum permitted noise from a machine.
- Comparing machines before and after modifications to reduce the noise.

Sound power is measured in watts or picowatts, and sound power levels are traditionally given in decibels (dB re 1pW). Refer table 8 for sound power level of whole unit and table 9 for sound power levels of fan only.

Model No.	CFM	ESP	Blower		Octave Band Frequency Hz								dB(A)
		IWG	RPM	BHP	63	125	250	500	1000	2000	4000	8000	
DMS-190	5800	1	919	2.94	71.60	74.62	81.62	83.62	84.62	81.62	75.62	72.62	89.62
DMS-240	7400	1	981	4.65	73.45	76.45	83.45	85.45	86.45	83.45	77.45	74.45	91.45
DMS-260	8000	1	715	3.67	71.00	74.00	81.00	83.00	84.00	81.00	75.00	72.00	89.0
DMS-340	10000	1	797	6.06	74.87	77.87	84.87	86.87	87.87	84.87	78.87	75.87	92.87

Ref 1 x 10^-12 watts

TABLE 8 : SOUND POWER LEVELS (DMS SABER UNITS)

Model	CFM	ESP	Blower			Octave Band Mid Frequency (HZ)								Total (dBA)
			RPM	Kw	BHP	63	125	250	500	1K	2K	4K	8K	
DMS-190	5800	1	919	2.2	2.9	68.5	71.5	78.5	80.5	81.5	78.5	72.5	69.5	86.5
DMS-240	7400	1	981	3.47	4.7	72.5	75.5	82.5	84.5	85.5	82.5	76.5	73.5	90.5
DMS-260	8000	1	715	2.74	3.7	69.8	72.8	79.8	81.8	82.8	79.8	73.8	70.8	87.8
DMS-340	10000	1	797	4.52	6.1	74.4	77.4	84.4	86.4	87.4	84.4	78.4	75.4	92.4

TABLE 9 : SOUND POWER LEVELS (STANDARD FANS)

VOLT FREE CONTACT

All Saber units are supplied with Volt free contact, Refer to lectrical wiring schematic that are pasted inside the unit.

CAUTION

HOOK UP EMERGENCY SHUT - OFF BUTTON

SEQUENCE OF OPERATIONS OVERVIEW

For these units, the thermostat makes a circuit between "R" and "Y1" for the first stage of cooling. The call is passed to the unit control board (UCB), which then determines whether the requested operation is available and, if so, which components to energize.

For electric heat units, the UCB passes the call to the electric heater. In both cases, when the "W1" call is sensed, the indoor air blower is energized following a specified heating delay. If at any time a call for both heating and cooling are present, the heating operation will be performed. If operating, the cooling system is halted as with a completion of a call for cooling. Heating always takes priority.

COOLING SEQUENCE OF OPERATION

1. CONTINUOUS BLOWER

By setting the room thermostat fan switch to "ON" the supply air blower will operate continuously.

2. INTERMITTENT BLOWER

With the room thermostat fan switch set to "AUTO" and the system switch set to either the "AUTO" or "HEAT" settings, the blower is energized whenever a cooling or heating operation is requested. The blower is energized after any specified delay associated with the operation. When energized, the indoor blower has a minimum run time of 30 seconds. Additionally, the indoor blower has a delay of 10 seconds between operations.

3. NO OUTDOOR AIR OPTIONS

When the thermostat calls for the first stage of cooling, the low voltage control circuit from "R" to "Y1" and "G' is completed. For first stage cooling, compressor #1, condenser fan motor # 1 & 2 are energized. After completing the specified fan on delay for cooling, the UCB will energize the blower motor. When the thermostat calls for the second stage of cooling, the low-voltage control circuit from "R" to "Y2" is completed. Compressor # 2 is energized, provided it has not been locked out. If there is an initial call for both stages of cooling, the UCB will delay energizing compressor # 2 by 30 seconds in order to avoid a power in rush. Once the thermostat has been satisfied, it will de-energize Y1 and

Y2. If the compressors have satisfied their minimum run times, the compressors and condenser fansare de-energized. Otherwise, the unit operates each cooling system until the minimum run times for the compressors have been completed. Upon the final compressor de-energizing, the blower is stopped following the elapse of the fan off delay for cooling.

To be available, a compressor must not be locked out due to a high or low pressure switch or freezestat trip and the anti short cycle delay (ASCD) must have elapsed.

COOLING OPERATION ERRORS

Each cooling system is monitored for operation outside of the intended parameters. Errors are handled as described below. All system errors override minimum run times for compressors.

HIGH PRESSURE LIMIT SWITCH

During cooling operation, if a high pressure limit switch opens, the UCB will de-energize the associated compressor, initiate the ASCD (anti short cycle delay), and, if the other compressor is idle, stop the condenser fans. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the halted compressor.

Should a high pressure switch open three times within two hours of operation, the UCB will lock out the associated compressor and flash a code (see table 10). If the other compressor is inactive, the condenser fans will be de-energized.

LOW PRESSURE LIMIT SWITCH

The low pressure limit switch is not monitored during the initial 30 seconds of a cooling system's operation. For the following 30 seconds, the UCB will monitor the low pressure switch to ensure it closes. If the low pressure switch fails to close after the 30 second monitoring phase, the UCB will de-energize the associated compressor, initiate the ASCD, and, if the other compressor is idle, stop the condenser fans. Once the low pressure switch has been proven (closed during the 30 second monitor period described above), the UCB will monitor the low pressure limit switch for any openings. If the low pressure switch opens for greater than 5 seconds, the UCB will de-energize the associated compressor, initiate the ASCD, and, if the other compressor is idle, stop the condenser fans. If the call for cooling is still present at the conclusion of the ASCD, the UCB will re-energize the halted compressor. Should a low pressure switch open three times within one hour of operation, the UCB will lock out the associated compressor and flash a code (table 10). If the other compressor is inactive, the condenser fans will be de-energized.

FREEZESTAT

During cooling operation, if a freezestat opens, the UCB will de-energize the associated compressor, initiate the ASCD, and, if the other compressor is idle, stop the condenser fans. If the call for cooling is still present at the conclusion of the ASCD, the UCB will reenergize the halted compressor. Should a freezestat open three times within two hours of operation, the UCB will lock out the associated compressor and flash a code (table 10). If the other compressor is inactive, the condenser fans will be de-energized.

LOW AMBIENT COOLING (OPTIONAL)

To determine when to operate in low ambient mode, the UCB has a pair of terminals connected to a temperature activated switch set at 50°F. When the low ambient switch is closed and the thermostat is calling for cooling, the UCB will operate in the low ambient mode. Low ambient mode operates the compressors in this manner: 10 minutes on, 5 minutes off. The indoor blower is operated throughout the cycle. The 5 minute off period is necessary to defrost the indoor coil. Low ambient mode always begins with compressor operation. Compressor minimum run time may extend the minutes of compressor operation. The defrost cycle will begin immediately following the elapse of the minimum run time. When operating in low ambient mode, the UCB will not lockout the compressors due to a freezestat trip. However, a freezestat trip will de-energize the associated compressor. If the call for cooling is still present at the end of the ASCD and the freezestat has closed, the unit will resume operation.

SAFETY CONTROLS

The unit control board monitors the following inputs for each cooling system :

1. A suction line freezestat to protect against low evaporator temperatures due to a low air flow or a low Installation, return air temperature, (opens at 26 ± 5°F and resets at 38 ± 5°F).
2. A high pressure switch to protect against excessive discharge pressures due to a blocked condenser coil or a condenser motor failure, (opens at 415 ± 15 psig and resets at 280 ± 15 psig).
3. A low pressure switch to protect against loss of refrigerant charge, (opens at 35 ± 5 psig and resets at 60 ± 5 psig). The above pressure switches are hard soldered to the unit. The refrigeration systems are independently monitored and controlled.

   On any fault, only the associated system will be affected by any safety / preventive action. The other refrigerant system will continue in operation unless it is affected by the fault as well. The unit control board monitors the temperature limit switch of electric heat units.

COMPRESSOR PROTECTION

The compressors also have inherent (internal) protection. If there is an abnormal temperature rise in a compressor, the protector will open to shut down the compressor. The UCB incorporates features to minimize compressor wear and damage.

An anti short cycle delay (ASCD) is utilized to prevent operation of a compressor too soon after its previous run. Additionally, a minimum run time is imposed any time a compressor is energized. The ASCD is initiated on unit start up and on any compressor reset or lock out.

FLASH CODES

The UCB will initiate a flash code associated with errors within the system. Refer to UNIT CONTROL BOARD FLASH CODES Table 10.

RESET

Remove the call for cooling, by raising thermostat setting higher than the conditioned space temperature. This resets any pressure or freezestat flash codes.

ELECTRIC HEATING SEQUENCE OF OPERATIONS

The following sequence describes the operation of the electric heat section Two stage heating (Heaters MUST use a two stage thermostat):

a. Upon a call for first stage heat by the thermostat, the heater contactor will be energized. After completing the specified fan on delay for heating, the UCB will energize the blower

motor. If the second stage of heat is required, second heater contactor will be energized. After completing the specified fan on delay for heating, the UCB will energize the blower motor.

b. The thermostat will cycle the electric heat to satisfy the heating requirements of the conditioned space.

HEATING OPERATION ERRORS

TEMPERATURE LIMIT

If the UCB senses zero volts from the high temperature limit, the indoor blower motor is immediately energized. This limit is monitored regardless of unit operation status, i.e. the limit is monitored at all times. If the temperature limit opens three times within one hour, it will lock on the indoor blower motor and a flash code is initiated (See Table 10).

SAFETY CONTROLS

The unit control board monitors the temperature limit switch of electric heat units. The control circuit includes the following safety controls :

Temperature Limit Switch (AUTO)

This control is located inside the heater compartment and is set to open at 120°F. It resets automatically. The limit switch operates when a high temperature condition, caused by inadequate supply air flow occurs, thus shutting down the heater and energizing the blower.

RESET

Remove the call for cooling, by raising thermostat setting higher than the conditioned space temperature. This resets any pressure or freezestat flash codes.

FLASH CODES

The UCB will initiate a flash code associated with errors within the system. Refer to UNIT CONTROL BOARD FLASH CODES Table 10.

START UP (COOLING)

PRESTART CHECK LIST

After installation has been completed :

1. Check the electrical supply voltage being supplied. Be sure that it is the same as listed on the unit nameplate.
2. Set the room thermostat to the on position.
3. Turn unit electrical power on.
4. Set the room thermostat fan switch to on.
5. a. Check indoor blower rotation. If blower rotation is in the wrong direction. Refer to Phasing Section in general information section.
   b. Check blower drive belt tension.
   c. Check bearing lubrication. If it requires lubrication, grease it.
6. Check the unit supply air (CFM).
7. Measure evaporator fan motor amp draw.
8. Set the room thermostat fan switch to off.
9. Turn unit electrical power off.

OPERATING INSTRUCTIONS

1. Turn unit electrical power on.
2. Set the room thermostat setting to lower than the room temperature.
3. First stage compressors will energize after the built in time delay (five minutes).

4. The second stage of the thermostat will energize second stage compressor if needed.

POST START CHECK LIST

1. Verify proper system pressures for both circuits.
2. Measure the temperature drop across the evaporator coil.
3. Measure the system Amperage draw across all legs of 3 phase power wires.
4. Measure the condenser fan amp draw.

SHUT DOWN

1. Set the thermostat to highest temperature setting.
2. Turn off the electrical power to the unit.

BELT DRIVE BLOWER

All units have belt drive single speed blower motors. The variable pitch pulley on the blower motor can be adjusted to obtain the desired supply air CFM.

TROUBLE SHOOTING

COOLING TROUBLE SHOOTING GUIDE

WARNING

TROUBLESHOOTING OF COMPONENTS MAY REQUIRE OPENING THE ELECTRICAL CONTROL BOX WITH THE POWER CONNECTED TO THE UNIT. USE EXTREME CARE WHEN WORKING WITH LIVE CIRCUITS! CHECK THE UNIT NAMEPLATE FOR THE CORRECT LINE VOLTAGE AND SET THE VOLTMETER TO THE CORRECT RANGE BEFORE MAKING ANY CONNECTIONS WITH LINE TERMINALS.

Troubleshooting of components may require opening theelectrical control box with the power connected to the unit. Use extreme care when working with live circuits! Check the unit nameplate for the correct line voltage and set the voltmeter to the correct range before making any connections with line terminals. When not necessary, shut off all electric power to the unit prior to any of the following maintenance procedures so as to prevent personal injury.

CAUTION

LABEL ALL WIRES PRIOR TO DISCONNECTION WHEN SERVICING CONTROLS. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION, WHICH COULD CAUSE INJURY TO PERSON AND/OR DAMAGE UNIT COMPONENTS. VERIFY PROPER OPERATION AFTER SERVICING.

*** On calls for cooling, if the compressors are operating but the supply air blower motor does not energize after a short delay (the room thermostat fan switch is in the "AUTO" position).**

1. Turn the thermostat fan switch to the ON position. If the supply air blower motor does not energize, go to Step 3.
2. If the blower motor runs with the fan switch in the ON position but will not run after the first compressor has energized when the fan switch is in the AUTO position, check the room thermostat for contact between R and G in the AUTO position during calls for cooling.
3. If the supply air blower motor does not energize when the fan switch is set to ON, check that line voltage is being supplied to the blower contactor, and that the contactor is pulled in. Check for loose wiring between the contactor and the supply air blower motor.
4. If blower contactor is pulled in and voltage is supplied to contactor, lightly touch the supply air blower motor housing. If it is hot, the motor may be off on internal protection. Cancel any thermostat calls and set the fan switch to AUTO. Wait for the internal overload to reset. Test again when cool.
5. If blower contactor is not pulled in, check for 24 volts at the contactor coil. If 24 volts are present but it is not pulled in, replace the contactor.
6. Failing the above, if there is line voltage supplied at contactor and it is pulled in, and the supply air blower motor still does not operate, replace the motor.
7. If 24 volts is not present at blower contactor, check that 24 volts is present at the UCB supply air blower motor terminal, "FAN". If 24 volts is present at the FAN, check for loose wiring between the UCB and blower contactor.
8. If 24 volts is not present at the "FAN" terminal, check for 24 volts from the room thermostat. If 24 volts are not present from the room thermostat, check for the following :
   - Proper operation of the room thermostat (contact between R and G with the fan switch in the ON position and in the AUTO position during operation calls),
   - Proper wiring between the room thermostat and the UCB, and
   - Loose wiring from the room thermostat to the UCB.
9. If 24 volts is present at the room thermostat but not at the UCB, check for proper wiring between the thermostat and the UCB, i.e. that the thermostat G terminal is connected to the G terminal of the UCB, and for loose wiring.
10. If the thermostat and UCB are properly wired, replace the UCB.

On calls for cooling, the supply air blower motor is operating but compressor # 1 is not (the room thermostat fan switch is in the "AUTO" position).

1. If compressor # 1 does not energize on a call for cooling, check for line voltage at the compressor contactor 1, and that the contactor is pulled in. Check for loose wiring between the contactor and the compressor.
2. If compressor contactor 1 is pulled in and voltage is supplied, lightly touch the compressor housing. If it ishot, the compressor may be off on inherent protection. Cancel any calls for cooling and wait for the internal overload to reset. Test again when cool.
3. If compressor contactor 1 is not pulled in, check for 24 volts at the coil. If 24 volts are present and contactor is not pulled in, replace the contactor.
4. Failing the above, if voltage is supplied at compressor contactor 1, it is pulled in, and the compressor still does not operate, replace the compressor.
5. If 24 volts is not present at compressor contactor 1, check for 24 volts at the UCB terminal, C1. If 24 volts is present, check for loose wiring between C1 and the compressor contactor.
6. If 24 volts is not present at the C1 terminal, check for 24 volts from the room thermostat at the UCB Y1 terminal. If 24 volts is not present from the room thermostat, check for the following :
   - 24 volts at the thermostat Y1 terminal.
   - Proper wiring between the room thermostat and the UCB, i.e. Y1 to Y1, Y2 to Y2.
   - Loose wiring from the room thermostat to the UCB.
7. If 24 volts is present at the UCB Y1 terminal, the compressor may be out due to an open high pressure switch, low pressure switch, or freezestat. Check for 24 volts at the HPS1, LPS1, and FS1 terminals of the UCB. If a switch has opened, there should be a voltage potential between the UCB terminals, e.g. if LPS1 has opened, there will be a 24 volt potential between the LPS1 terminals.
8. If 24 volts is present at the UCB Y1 terminal and none of the protection switches have opened, the UCB may have locked out the compressor for repeat trips. The UCB should be flashing an alarm code. If not, press and release the ALARMS button on the UCB. The UCB will flash the last five alarms on the LED. If the compressor is locked out, cancel any call for cooling. This will reset any compressor lock outs.

NOTE : While the above step will reset any lockouts, compressor # 1 may be held off for the ASCD. See the next step.

9. If 24 volts is present at the UCB Y1 terminal and none of the switches are open and the compressor is not locked out, the UCB may have the compressor in an ASCD. Check the LED for an indication of an ASCD cycle. The ASCD should time out within 5 minutes. Press and release the TEST button to reset all ASCDs.
10. If none of the above corrected the error, test the integrity of the UCB. Disconnect the C1 terminal wire and jumper it to the Y1 terminal. DO NOT jump the Y1 to C1 terminals. If the compressor engages, the UCB has faulted.
11. If none of the above correct the error, replace the UCB.

*** On calls for the second stage of cooling, the supply air blower motor and compressor # 1 are operating but compressor # 2 is not (the room thermostat fan switch is in the "AUTO" position).**

1. Compressor # 2 will not energize simultaneously with compressor #1 if a call for both stages of cooling is received. The UCB delays compressor # 2 by 30 seconds to prevent a power surge. If after the delay compressor # 2 does not energize on a second stage call for cooling, check for line voltage at the compressor contactor 2, and that the contactor is pulled in. Check for loose wiring between the contactor and the compressor.
2. If compressor contactor 2 is pulled in and voltage issupplied, lightly touch the compressor housing. If it is hot, the compressor may be off on inherent protection. Cancel any calls for cooling and wait for the internal overload to reset. Test again when cool.

3. If compressor contactor 2 is not pulled in, check for 24 volts at the compressor contactor coil. If 24 volts is present and compressor contactor is not pulled in, replace the contactor.
4. Failing the above, if voltage is supplied at compressor contactor 2, and it is pulled in, and the compressor still does not operate, replace the compressor.
5. If 24 volts is not present at compressor contactor 2, check for 24 volts at the UCB terminal, C2. If 24 volts are present, check for loose wiring between C2 and the compressor contactor.
6. If 24 volts is not present at the C2 terminal, check for 24 volts from the room thermostat at the UCB Y2 terminal. If 24 volts is not present from the room thermostat, check for the following :
   - 24 volts at the thermostat Y2 terminal.
   - Proper wiring between the room thermostat and the UCB, i.e. Y1 to Y1, Y2 to Y2.
   - Loose wiring from the room thermostat to the UCB.
7. If 24 volts is present at the UCB Y2 terminal, the compressor may be out due to an open high pressure switch, low pressure switch, or freezestat. Check for 24 volts at the HPS2, LPS2, and FS2 terminals of the UCB. If a switch has opened, there should be a voltage potential between the UCB terminals, e.g. if LPS2 has opened, there will be 24 volts of potential between the LPS2 terminals.
8. If 24 volts is present at the UCB Y2 terminal and none of the protection switches have opened, the UCB may have locked out the compressor for repeat trips. The UCB should be flashing a code. If not, press and release the ALARMS button on the UCB. The UCB will flash the last five alarms on the LED. If the compressor is locked out, remove any call for cooling at the thermostat or by disconnecting the thermostat wiring at the Y2 UCB terminal. This will reset any Installation, compressor lock outs.

NOTE : While the above step will reset any lock outs, compressor # 1 will be held off for the ASCD, and compressor # 2 may be held off for a portion of the ASCD.
See the next step.

9. If 24 volts is present at the UCB Y2 terminal and none of the switches are open and the compressor is not locked out, the UCB may have the compressor in an ASCD. Check the LED for an indication of an ASCD cycle. The ASCD should time out within 5 minutes. Press and release the TEST button to reset all ASCDs.
10. The UCB can be programmed to lock out compressor operation during free cooling and in low ambient conditions. These options are not enabled by default. Local distributors can test the UCB for this programming.
11. If none of the above corrected the error, test the integrity of the UCB. Disconnect the C2 terminal wire and jumper it to the Y2 terminal. DO NOT jump the Y2 to C2 terminals. If the compressor engages, the UCB has faulted.
12. If none of the above correct the error, replace the UCB.

*** On a call for cooling, the supply air blower motor and compressor # 2 are operating but compressor # 1 is not (the room thermostat fan switch is in the "AUTO" position).**

1. Compressor # 2 is energized in place of compressor # 1 when compressor # 1 is unavailable for cooling calls. Check the UCB for alarms indicating that compressor # 1 is locked out. Press and release the ALARMS button if the LED is not flashing an alarm.
2. Check for line voltage at the compressor contactor 1, and that the contactor is pulled in. Check for loose wiring between the contactor and the compressor.
3. If compressor contactor 1 is pulled in and voltage is supplied at the contactor 1, lightly touch the compressor housing. If it is hot, the compressor may be off on inherent protection. Cancel any calls for cooling and wait for the internal overload to reset. Test again when cool.
4. If compressor contactor 1 is not pulled in, check for 24 volts at the coil. If 24 volts is present and compressor contactor 1 is not pulled in, replace the contactor.
5. Failing the above, if voltage is supplied at compressor contactor 1, and it is pulled in, and the compressor still does not operate, replace the compressor.
6. If 24 volts is not present at compressor contactor, check for 24 volts at the UCB terminal, C1. If 24 volts is present, check for loose wiring between C1 and the compressor contactor 1.
7. If 24 volts is not present at the C1 terminal, check for 24 volts from the room thermostat at the UCB Y1 terminal. If 24 volts are not present at the UCB Y1 terminal, the UCB may have faulted. Check for 24 volts at the Y1 ECON terminal. If 24 volts is not present at Y1 "ECON", the UCB has faulted. The UCB should de-energize all compressors on a loss of call for the first stage of cooling, i.e. a loss if 24 volts at the Y1 terminal.
8. If 24 volts are present at the UCB Y1 terminal, the compressor may be out due to an open high-pressure switch, low-pressure switch, or freezestat. Check for 24 volts at the HPS1, LPS1, and FS1 terminals of the UCB. If a switch has opened, threshold be a voltage potential between the UCB terminals, e.g. if LPS1 has opened, there will be a 24- volt potential between the LPS1 terminals.
9. If 24 volts is present at the UCB Y1 terminal and none of the protection switches have opened, the UCB may have locked out the compressor for repeat trips. The UCB should be flashing a code. If not, press and release the ALARMS button on the UCB. The UCB will flash the last five alarms on the LED. If the compressor is locked out, remove any call for cooling. This will reset any compressor lock outs.

*** NOTE : While the above step will reset any lock outs, compressor # 2 will be held off for the ASCD, and compressor # 1 may be held off for a portion of the ASCD. See the next step.**

10. If 24 volts is present at the UCB Y1 terminal and none of the switches are open and the compressor is not locked out, the UCB may have the compressor in an ASCD. Check the LED for an indication of an ASCD cycle. The ASCD should time out within 5 minutes. Press and release the TEST button to reset all ASCDs.
11. If 24 volts is present at the UCB Y1 terminal and the compressor is not out due to a protective switch trip, repeat trip lock out, or ASCD, the economizer terminals of the UCB may be improperly wired. Check for 24 volts at the Y1 "OUT" terminal of the UCB. If 24 volts is present, trace the wiring from Y1 "OUT" for incorrect wiring. If 24 volts is not present at the Y1 "OUT" terminal, the UCB must be replaced.
12. If none of the above corrected the error, test the integrity of the UCB. Disconnect the C1 terminal wire and jumper it to the Y1 terminal. DO NOT jump the Y1 to C1 terminals. If the compressor engages, has faulted.
13. If none of the above correct the error, replace the UCB.

UNIT FLASH CODES

Various flash codes are utilized by the unit control board (UCB) to aid in troubleshooting. Flash codes are distinguished by the short on and off cycle used (approximately 200 ms on and 200 ms off). To show normal operation, the control board flashes a 1 second on, 1 second off heartbeat during normal operation. This is to verify that the UCB is functioning correctly. Do not confuse this with an error flash code. To prevent confusion, a 1-flash, flash code is not used. Current alarms are flashed on the UCB LED. Pressing and releasing the ALARMS button on the UCB can check the alarm history. The UCB will cycle through the last five (5) alarms, most recent to oldest, separating each alarm flash code by approximately 2 seconds. In some cases, it may be necessary to "zero" the ASCD for the compressors in order to perform troubleshooting. To reset all ASCDs for one cycle, press and release the UCB TEST button once. See table 10, Unit Flash Codes.

Flash Code	Description
On Steady	Control Failure - Replace Control
Heart Beat	Normal Operation
1 Flash	Not Applicable
2 Flashes	Control Waiting ASCD[1]
3 Flashes	HPS1 - Compressor Lockout
4 Flashes	HPS2 - Compressor Lockout
5 Flashes	LPS1 - Compressor Lockout
6 Flashes	LPS2 - Compressor Lockout
7 Flashes	FS1 - Compressor Lockout
8 Flashes	FS2 - Compressor Lockout
9 Flashes	No Jumper Plug in Heat Section
10 Flashes	Compressors Locked Out on Low Outdoor Air Temperature[1]
11 Flashes	Not Applicable
12 Flashes	Fan Overload Switch Trip
13 Flashes	Compressor Held Off Due to Low Voltage[1]
14 Flashes	EEPROM Storage Failure (Control Failure)
OFF	No Power or Control Failure.

1: These flash codes do not represent alarms

TABLE 10: UNIT FLASH CODES

MAINTENANCE

The Saber Packaged Air Conditioners are premium quality machines with very low maintenance requirements. Compressors used in Saber Packaged Units are of Scroll type and are charged with the correct amount of refrigerant and lubricating oil. Unless there is a leak in the system, no topping up is generally required. Standard DMS Saber Models except 16TR models (DMS 190) need lubrication every 12 months.

EVERY MONTH

- Remove the filters and blow compressed air over them to get rid of loose dust. Visually inspect the filter conditions, replace them with new ones of same sizes if required.
- Saber Packaged Air Conditioners are provided with a specially designed drain pan, for proper maintenance check and clean blockages at drain connections if any.

EVERY 3 MONTHS

In addition to the monthly maintenance above, check the belt tension of evaporator fan. A correct tension is indicated when the belt has a relaxation of approximately 10 mm to 13 mm when pressed lightly with a finger.

EVERY SIX MONTHS

In addition to the maintenance done every three months :

- The condenser coils should be cleaned by spraying water over it at low pressure or with a brush while ensuring that the fins are not damaged.
- Check all electrical connections and tighten them if required.
- Clean all accessible electrical panels of dirt and dust. Before cleaning the control panels, ENSURE that the electrical power to the unit is switched off.

EVERY 12 MONTHS

In addition to the maintenance done every six months :

- Use a proper cleaning cloth to clean fan blades and motors.
- Ensure that the unit is working properly by checking, current, voltages, pressures and temperatures.
- Check the earthing or grounding of the unit.
- Check the exterior of the unit for any signs of corrosion. Even though it is highly unlikely, if any corrosion that is seen, should be removed by proper sanding the surface. Repaint the unit with proper touch up paint, availablefrom York.
- Check the unit for any unusual vibrations or noise, locate the cause and rectify it by changing mounts, base.

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Johnson Controls has a wide range of York products for residential, light commercial and commercial applications. Our offering includes package & split air conditioners and heat pumps. In addition, Johnson Controls offers chillers, air handling units, ventilation equipment and controls for larger projects.

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